



AF/ 3679  
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**PATENT**  
Attorney Docket N<sup>o</sup> ASA 01-2-1

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of : A.L. Pepper Aasgaard  
Serial N<sup>o</sup> : 10/050,084  
Filed : January 14, 2002  
Group Art Unit : 3679  
Examiner : Fleming Saether  
For : SELF-POLISHING AND TAPPING RIVET ASSEMBLY

MS Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

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**GROUP 3600**

**TRANSMITTAL OF APPEAL BRIEF**

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Penny L. Flint  
Penny L. Flint

DATED: April 2, 2004

Please find enclosed herewith three (3) copies of Appellants' Brief on Appeal. A *Petition* extending the time for filing the Appeal Brief from December 2, 2003 to April 2, 2004 is also enclosed.

Please charge the fee of **\$740.00** for filing an Appeal Brief to Deposit Account N° 19-4882. In the event that the Commissioner determines that any additional fees are required, or that any overpayment has been made, for this or any other Paper in this application, the Commissioner is hereby authorized to charge any such additional fees and to credit any overpayment to Deposit Account N° 19-4882. A duplicate copy of this *Petition* is enclosed for accounting purposes only.

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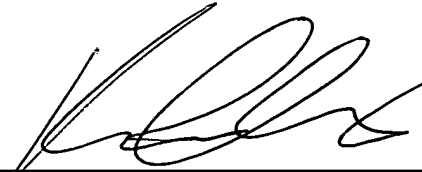
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DATED: April 2, 2004.

Respectfully submitted,

A.L. Pepper Aasgaard,

By



Kevin E. West  
Reg. N° 43,983



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Docket No. ASA 01-2-1

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**APPELLANT'S BRIEF ON APPEAL**

This is an appeal from the Final Office Action dated June 26, 2003, finally rejecting claims 1-6, 8-36, and 38-45.

**(1) REAL PARTY IN INTEREST**

The real party in interest is A. L. Pepper Aasgaard.

**(2) RELATED APPEALS AND INTERFERENCES**

Appellant is not aware of any related appeals or interferences.

**(3) STATUS OF CLAIMS**

The status of the claims is as follows:

Claims allowed: none

Claims objected to: none

Claims rejected: Claims 1-6, 8-36, and 38-45

Claims canceled: 7 and 37

Claims withdrawn: none

#### **(4) STATUS OF AMENDMENTS AFTER FINAL**

No amendments were proffered after the Final Office Action.

#### **(5) SUMMARY OF INVENTION**

Applicant's invention is directed to a self-tapping and self-polishing blind setting rivet assembly (e.g., self-polishing blind setting rivet assembly 100, pages 6-19, FIGS. 1-10) capable of permanently fastening one or more work pieces together and/or to another object. In exemplary embodiments of the invention, the self-tapping and self-polishing blind setting rivet assembly comprises a rivet body 102 having a hollow tubular sleeve 104 and an enlarged flattened head 106. The rivet body surrounds a mandrel 108 having a weakened area of reduced diameter 122 for allowing detachment of the mandrel shaft upon application of sufficient axial force to the shank. This application of force sets the rivet by causing a tapered shoulder section 112 of the mandrel to deform the rivet sleeve. The mandrel shank is terminated in a self-tapping and self-polishing auger 110 that punctures, spreads, self-taps and self-polishes an aperture in the work piece(s) through which the rivet sleeve passes. The self-tapping and self-polishing auger includes a cutting portion 118 providing one or more cutting edges 140 & 142 that incrementally shave or carve small amounts of work piece material allowing torque to be dispersed over several small cutting edges simultaneously and a polishing portion 120 including at least one polishing edge 148 & 150 for deburring and polishing the aperture created by the cutting edges. The rivet assembly (e.g., rivet assembly 400 FIG. 14) may further include a hollow cylindrical threaded bolt head 408 onto which a nut may be affixed for removably attaching other work pieces, components, or the like.

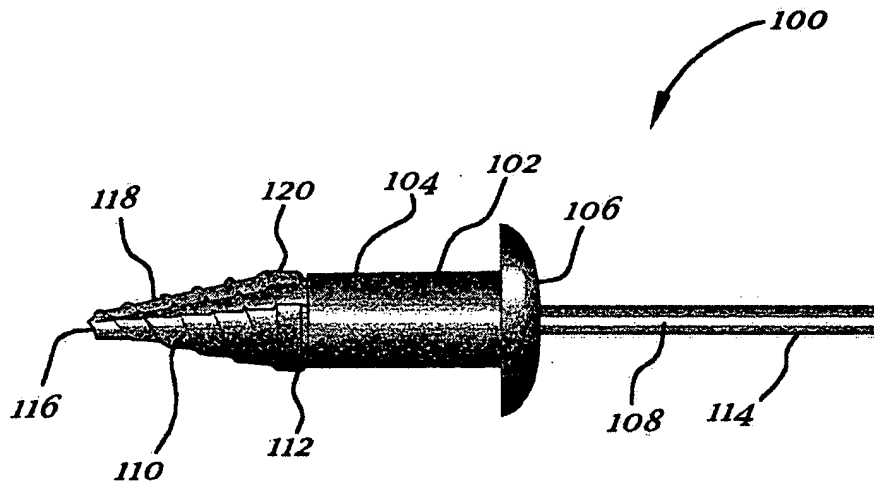


FIG. 1

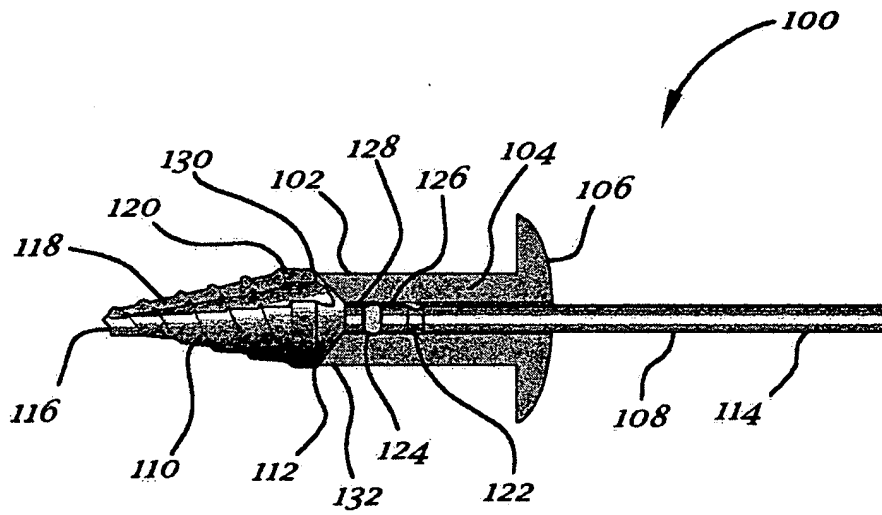
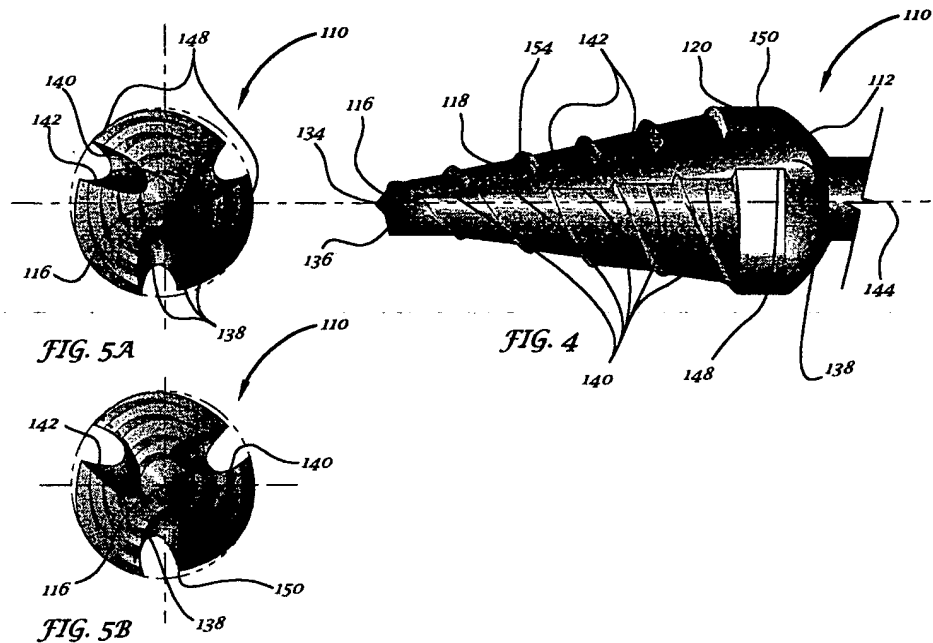


FIG. 2



**Figure 1: Self-Polishing and Tapping Rivet Assembly (FIGS. 1, 2, 4, 5A and 5B)**

## **(6) ISSUES**

I. Whether the Patent Office properly rejected Claims 1, 2, 5, 6, 8, 11-14, 20, 21, 24-26, 29, 30 and 41-42 under 35 U.S.C. § 102(b) as being anticipated by Keller. (Swiss Patent No. 671,617).

II. Whether the Patent Office properly rejected Claims 1, 2, 4, 13-15, 16-21, 23, 26, 28 and 31-44 under 35 U.S.C. § 103(a) as being unpatentable over Aasgaard (U.S. Patent No. 5,915,901) in view of Tisserant (U.S. Patent No. 2,897,696).

III. Whether the Patent Office properly rejected Claims 3, 5, 8, 9, 11, 22, 24, 27, 29 and 37 under 35 U.S.C. § 103(a) as being unpatentable over Aasgaard as modified by Tisserant as applied to claims 1, 2, 20, 26 and 36, and further in view of Korb et al. (U.S. Patent No. 4,582,458).

IV. Whether the Patent Office properly rejected Claims 6, 12, 25 and 30 under 35 U.S.C. § 103(a) as being unpatentable over Aasgaard as modified by Tisserant and Korb as applied to claims 1, 7, 20 and 29, and further, and further in view of Peterson (U.S. Patent No. 5,915,901).

#### **(7) GROUPING OF CLAIMS**

For each ground of rejection that Appellant contests herein which applies to more than one Claim, such additional Claims, to the extent separately identified and argued below, do not stand and fall together.

The Claims are at least as distinguishable as grouped below:

- Group I: Claims 1, 2, 4, 10, 13, 15, 17-21, 23, 28, 31 and 33-36 and 38-40 stand and fall together.
- Group II: Claims 5 and 24 stand and fall together.
- Group III: Claims 6 and 25 stand and fall together.
- Group IV: Claims 8 and 26 stand and fall together.
- Group V: Claims 11 and 29 stand and fall together.
- Group VI: Claims 12 and 30 stand and fall together.
- Group VII: Claims 14 and 32 stand and fall together.
- Group VIII: Claim 41 stands and falls alone.
- Group IX: Claim 42 stands and falls alone.
- Group X: Claim 43 stands and falls alone.
- Group XI: Claim 16 stands and falls alone.
- Group XII: Claims 44 and 45 stand and fall together.
- Group XIII: Claims 3 and 22 stand and fall together.
- Group XIV: Claims 9 and 27 stand and fall together.

#### **(8) ARGUMENT**

The present invention provides a self-tapping and self-polishing blind setting rivet assembly that employs an auger comprising a cutting portion including one or more cutting edges that incrementally shave or carve small amounts of work piece material from the

workpiece during formation of an aperture in the workpiece allowing torque to be dispersed over several small cutting edges simultaneously, and a polishing portion including at least one polishing edge for deburring and polishing the aperture formed by the cutting portion. By incrementally shaving or carving small amounts of material from the workpiece, the cutting portion allows the overall amount of torque required for inserting or tapping the rivet assembly through a workpiece to be substantially reduced compared to conventional self-boring drill-bit-based rivet assemblies, thereby allowing the rivet assembly to employ a mandrel having a thinner shank for greater ease in setting the rivet assembly. Moreover, by deburring and polishing the aperture formed by the cutting portion, the polishing portion removes excursions, burrs, and the like, formed during cutting of the aperture, to provide a stronger attachment in certain materials than would be possible with non-polishing rivet assemblies.

### **ISSUE I**

Did the Patent Office properly reject Claims 1, 2, 5, 6, 8, 11-14, 20, 21, 24-26, 29, 30 and 41-42 under 35 U.S.C. § 102(b) as being anticipated by Keller. (Swiss Patent No. 671,617)?

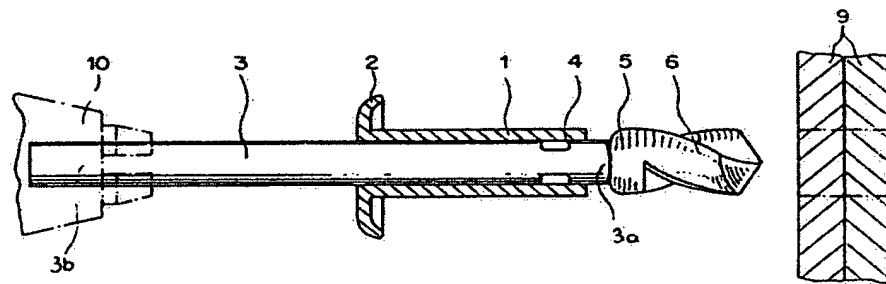
### **Group I**

Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. MPEP § 2131; *W.L. Gore & Assocs. v. Garlock*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Further, “anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim.” MPEP § 2131; *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)).

Claims 1, 2, 4, 10, 13, 15, 17-21, 23, 28, 31 and 33-40 recite an auger having both a cutting portion and a polishing portion. In particular, independent claim 1 recites “a mandrel including an auger having a groove generally longitudinally disposed therein, a



cutting portion including at least one cutting edge formed by the groove for incrementally shaving material from the workpiece for forming an aperture in the workpiece as said mandrel is rotated, and a polishing portion including at least one polishing edge formed by the groove for deburring and polishing the aperture created by said at least one cutting edge” while independent claim 20 recites “a mandrel including an auger having a groove generally longitudinally disposed therein for forming at least one cutting edge and at least one polishing edge; wherein . . . the at least one polishing edge is suitable for deburring polishing the aperture created by said at least one cutting edge” Claim 36 is similar to claim 1, reciting “means for cutting material from the workpiece as the mandrel is rotated for forming an aperture, and means for deburring and polishing the aperture created by said cutting means.”



**Figure 2: Keller, Swiss Patent No. 671,617 (FIG. 1)**

Keller fails to disclose, teach or suggest both a cutting portion and a polishing portion as presently claimed. Instead, Keller discloses a rivet assembly employing a conventional drill bit for boring a hole within a workpiece. Such drill bit rivet assemblies are generally discussed in the “Background of the Invention” section of Applicant’s application. In formulating his rejection, the Examiner equates the tip of the drill bit to the “cutting portion,” and the cylindrical portion of the drill bit above the tip to the “polishing portion” of the presently claimed rivet assembly. This application of the teaching of Keller is incorrect. Nowhere does Keller disclose that the drill bit includes a “groove generally longitudinally disposed therein.” Instead, as in all drill bits, the channel formed in the

Keller drill bit spirals about the bit. Further, unlike the presently claimed cutting portion, the tip of the drill bit disclosed by Keller does not “incrementally shav[e] material from the workpiece.” Similarly, unlike the presently claimed polishing portion, the cylindrical portion of the Keller drill bit does not “deburr. . . and polish. . . the aperture formed” by the cutting portion. The tip and cylindrical portion of the drill bit instead function together to bore a hole through the workpiece to which the rivet is being applied. Nowhere in the translated text of the application of record does Keller disclose that the cylindrical portion of the drill bit is capable of “deburring and polishing” the aperture that the cylindrical portion itself forms. Consequently, Keller fails to anticipate the rivet assembly claimed in Claims 1, 2, 4, 10, 13, 15, 17-21, 23, 28, 31 and 33-40 under 35 U.S.C. § 102(b).

#### Groups II and III

Claims 5 and 24 recite that “the at least one cutting edge forms an angle with respect a longitudinal axis of the auger.” Claims 6 and 25 recite that “the at least one cutting edge is curved.” These limitations patentably distinguish Groups II and III from Group I and from each other. As discussed with respect to Group I, Keller discloses a conventional drill bit which bores through the workpiece to which the rivet is being applied. The drill bit disclosed by Keller does not include a cutting portion having one or more cutting edges as disclosed and claimed by Applicant. Thus, Keller also fails to disclose that “the at least one cutting edge forms an angle with respect a longitudinal axis of the auger” as claimed in claims 5 and 24, or that “the at least one cutting edge is curved” as claimed in claims 6 and 25. Consequently, Claims 5, 6, 24 and 25 are not anticipated by Keller.

#### Groups IV, V and VI

Claims 8 and 26 recite that “the at least one polishing edge comprises a leading polishing edge and a trailing polishing edge formed on opposite sides of the groove.” Claims 11 and 29 recite that “the at least one polishing edge forms an angle with respect a longitudinal axis of the auger.” Claims 12 and 30 recite that “the at least one polishing edge is curved.” These limitations patentably distinguish Groups IV, V, and VI from

Groups I, II and III, and from each other. As discussed with respect to Group I, Keller discloses a conventional drill bit which bores through the workpiece to which the rivet is being applied. The drill bit disclosed by Keller does not include a polishing portion having one or more polishing edges as disclosed and claimed by Applicant. Thus, Keller also fails to disclose that “the at least one polishing edge comprises a leading polishing edge and a trailing polishing edge formed on opposite sides of the groove” as claimed in claims 8 and 26, that “the at least one polishing edge forms an angle with respect a longitudinal axis of the auger” as claimed in claims 11 and 29, or that “the at least one polishing edge is curved as claimed in claims 12 and 30. Consequently, Claims 8, 11, 12, 26, 29 and 30 are not anticipated by Keller.

#### Group VII

Claims 14 and 32 recite a tip suitable for self-tapping the aperture, wherein “the tip includes a point suitable for piercing the workpiece, the point extending into an initial contact edge for removing workpiece material.” This limitation patentably distinguishes Group VII from Groups I through VI. Keller fails to disclose, teach or suggest the combination of a cutting portion including at least one cutting edge for incrementally shaving material from the workpiece for forming an aperture in the workpiece, a polishing portion including at least one polishing edge for deburring and polishing the aperture created, and a tip suitable for self-tapping the aperture, wherein the tip includes a point suitable for piercing the workpiece, the point extending into an initial contact edge for removing workpiece material as claimed. Instead, as discussed with respect to Groups I through VI, Keller discloses a conventional drill bit which bores through the workpiece to which the rivet is being applied. The drill bit disclosed by Keller does not include a cutting portion having one or more cutting edges or a polishing portion including one or polishing edges as disclosed and claimed by Applicant. Moreover, while the drill bit disclosed by Keller does have a tip, this tip is not self-tapping and does not include a point suitable for piercing the workpiece, the point extending into an initial contact edge for removing workpiece material. Consequently, claims 14 and 32 are not anticipated by Keller.

### Group VIII

Claim 41 recites that “the auger comprises a tip and shoulder portion, the groove being formed so that it extends longitudinally through the auger from the tip through the shoulder portion.” This limitation patentably distinguishes Group VIII from Groups I through VII. As discussed with respect to Group I, Keller discloses a conventional drill bit which bores through the workpiece to which the rivet is being applied. Nowhere does Keller disclose that the drill bit includes a groove formed so that it extends *longitudinally* through the auger. Instead, as in all drill bits, the channel formed in the Keller drill bit spirals about the bit. Consequently, claim 41 is not anticipated by Keller.

### Group IX

Claim 42 recites that “the auger has a length (l), the at least one cutting edge forms an angle ( $\alpha$ ) with respect to the longitudinal axis of the auger and the at least one polishing edge forms an angle ( $\beta$ ) with respect to the longitudinal axis of the auger, the values of angle ( $\alpha$ ) and angle ( $\beta$ ) being selected for the material properties of the workpiece.” This limitation patentably distinguishes Group IX from Groups I through VIII. Nowhere, does Keller disclose, teach or suggest the claimed relationship between the angles of the cutting and polishing edges with the material properties of the workpiece. Consequently, Claim 42 is not anticipated by Keller.

## ISSUE II

Did the Patent Office properly reject Claims 1, 2, 4, 10, 13-21, 23, 26, 28 and 31-44 under 35 U.S.C. § 103(a) as being unpatentable over Aasgaard (U.S. Patent No. 5,915,901) in view of Tisserant (U.S. Patent No. 2,897,696)?

Claim 37 was cancelled by Applicant, rendering the rejection of that claim under 35 U.S.C. § 102(b) moot.

### Groups I and VIII

When applying 35 U.S.C. 103, the following tenets of patent law must be adhered to: (A) the claimed invention must be considered as a whole; (B) the references must be

considered as a whole and must suggest the desirability and thus the obviousness of making the combination; (C) the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and (D) reasonable expectation of success is the standard with which obviousness is determined. *See MPEP § 2141 and Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 220 USPQ 182, 187 n.5 (Fed. Cir. 1986). To establish obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *MPEP § 2143.03* citing *In re Royka*, 180 USPQ 580 (C.C.P.A. 1974). *See also In re Wilson*, 165 USPQ 494 (C.C.P.A. 1970).

None of the references cited, either alone or in combination, teach or suggest a rivet assembly comprising “a mandrel including an auger having a groove generally longitudinally disposed therein, a cutting portion including at least one cutting edge formed by the groove for incrementally shaving material from the workpiece for forming an aperture in the workpiece as said mandrel is rotated, and a polishing portion including at least one polishing edge formed by the groove for deburring and polishing the aperture created by said at least one cutting edge” as presently claimed in Claim 1 (and claimed in means plus function form in claim 36), or “a mandrel including an auger having a groove generally longitudinally disposed therein for forming at least one cutting edge and at least one polishing edge; wherein . . . the at least one polishing edge is suitable for deburring polishing the aperture created by said at least one cutting edge as claimed in claim 20.

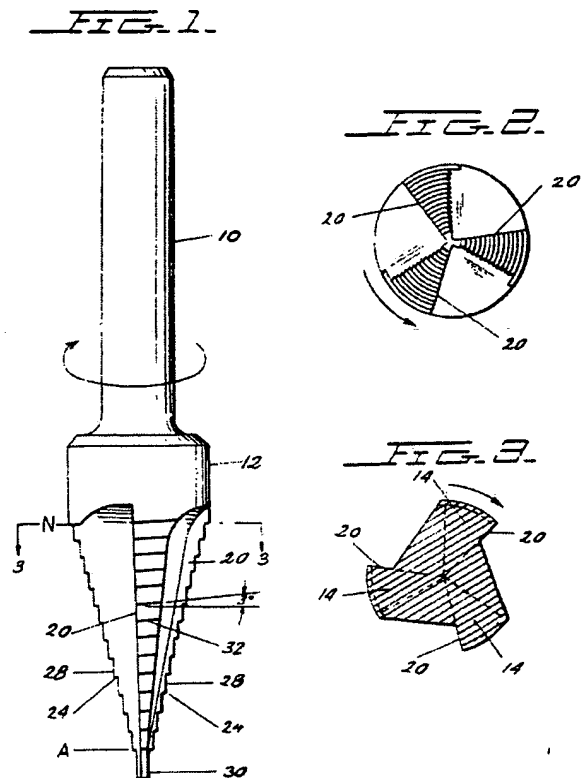
As noted by the Examiner, the primary reference, Aasgaard, discloses a rivet assembly comprising an auger formed on the mandrel of the rivet assembly, but does not disclose an auger or head having a polishing portion including a polishing edge for deburring and polishing the aperture formed by the auger. As a result, the Examiner relies on the Tisserant reference for teaching of a “polishing edge” recited in the claims. The Examiner asserts that “the groove at the portion labeled 12” illustrated in FIG. 1 of the Tisserant reference forms a polishing edge as claimed by Applicant since Tisserant indicates that it is desirable to cut “clean” holes which the Examiner asserts would “inherently” be inclusive of deburring and polishing. This assertion is incorrect. It is noted that

[T]he doctrine of inherency is available only when the prior inherent event can be established as a certainty. . . . A prior inherent event cannot be established based upon speculation or where a doubt exists.

*Ethyl Molded Products Co. v. Betts Package Inc.*, 9 U.S.P.Q. 2d 1001, 1032-33 (E.D. Ky. 1988). Moreover,

In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teaching of the applied prior art.

*Ex Parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990). Nowhere does the Tisserant reference disclose that the “the groove at the portion labeled 12” provides a polishing edge. Nowhere does the Tisserant reference ever claim that the drill bit disclosed therein provides deburring or polishing of the aperture formed. Instead, the Tisserant reference discloses a staged drill bit for drilling holes having different diameters in sheet metal. Thus, unlike the present invention, wherein the auger is inserted completely through the workpiece, the Tisserant bit is inserted only to the depth or stage needed to form a hole or aperture having the desired diameter. Because the groove of the Tisserant bit does not extend completely through the bit at the “portion labeled 12,” the bit would bind if inserted to that point due to the accumulation of metal shavings which could not be channeled away from the bit. Consequently, the portion of the Tisserant bit that is asserted to provide a polishing edge, namely, the groove at the “portion labeled 12,” would never even be inserted into the workpiece. If the Tisserant bit was to be used in a rivet assembly, as disclosed by Applicant, such binding would cause premature separation of the mandrel shank from the auger, undesirably preventing insertion of the rivet.



**Figure 3: Tisserant, United States Patent No. 2,897,696 (FIGS. 1, 2 and 3)**

Finally, there exists no reason, suggestion, or motivation from the prior art for modifying the teaching of the cited references to achieve Applicant's invention. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art suggests the desirability of the combination. MPEP § 2143.01. Further, the Examiner must consider the claimed invention "as a whole" and must put aside knowledge of Applicant's disclosure in reaching a determination of obviousness. MPEP § 2141.02. However, the rejection contained only assertions by the Examiner that structures shown in drawings of the cited references may be equated to the polishing edges claimed by Applicant, even though, when read in their entirety, the references do not disclose that the cited structures are used for deburring or polishing an aperture and Applicant has demonstrated that they are in fact not suited for this purpose. Thus, the Examiner has impermissibly attempted use the teaching of Applicant's specification to modify the cited references to achieve Applicant's claimed invention. MPEP § 2142; *In re Zurko*, 111 F.3d 887, 42 USPQ2d 1476 (Fed. Cir. 1997); *In Re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438

(Fed. Cir. 1991); *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990); *In re Laskowski*, 871 F.2d 115, 10 USPQ2d 1397 (Fed. Cir. 1989).

Consequently, Tisserant cannot be used with Aasgaard to teach or suggest the rivet assembly claimed in Claims 1, 2, 4, 10, 13, 15, 17-21, 23, 28 and 31, 33-36 and 38-41. Accordingly, Claims 1, 2, 4, 10, 13, 15, 17-21, 23, 28 and 31, 33-36 and 38-41 are allowable over the prior art of record.

#### Group IV

With respect to claims 8 and 26, Tisserant, either alone or in combination with Aasgaard, also fails to teach or suggest that “the at least one polishing edge comprises a leading polishing edge and a trailing polishing edge formed on opposite sides of the groove” as claimed, and there exists no reason, suggestion, or motivation from the prior art for modifying the teaching of the cited references to provide this limitation. Thus, Tisserant cannot be used with Aasgaard to teach or suggest the rivet assembly claimed in Claims 8 and 26. Accordingly, Claims 8 and 26 are allowable over the prior art of record.

#### Groups VII and X

Claim 43 recites a tip for self-tapping the aperture including a point extending into an initial contact edge wherein “the point and initial contact edge tap an aperture in the workpiece by puncturing and separating the workpiece and then scraping material from the workpiece for pulling the auger through the workpiece so that the auger is self-tapping.” This limitation patentably distinguishes Group X from Groups I through IX.

Tisserant, either alone or in combination with Aasgaard, fails to teach or suggest a tip suitable for self-tapping the aperture, wherein “the tip includes a point suitable for piercing the workpiece, the point extending into an initial contact edge for removing workpiece material” as claimed in claims 14, 32 and 43. However, the Examiner in the Office Action mailed June 26, 2003 argues that

[c]ontrary to applicant’s remarks, Tisserant does include a “point suitable for piercing”. The point (30) in would be



capable of piercing function as required of the claims event though it may not be the preferred function.

It is not argued that Tisserant cannot pierce a workpiece. Virtually any pointed object may be capable of piercing a second object if provided with sufficient force. Nevertheless, the Tisserant reference still fails to disclose, teach or suggest the claimed limitation of “a point suitable for piercing the workpiece, the point extending into an initial contact edge for removing workpiece material” as recited in claims 14 and 32 or that “the point and initial contact edge tap an aperture in the workpiece by puncturing and separating the workpiece and then scraping material from the workpiece for pulling the auger through the workpiece so that the auger is self-tapping” as recited in claim 43. Moreover, there exists no reason, suggestion, or motivation from the prior art for modifying the teaching of the cited references to provide these limitations. Thus, Tisserant cannot be used with Aasgaard to teach or suggest the rivet assembly claimed in Claims 14, 32 and 43. Accordingly, Claims 14, 32 and 43 are allowable over the prior art of record.

#### Group IX

With respect to Claim 42, Tisserant also fails to teach or suggest, either alone or in combination with Aasgaard, that “the auger has a length (l), the at least one cutting edge forms an angle ( $\alpha$ ) with respect to the longitudinal axis of the auger and the at least one polishing edge forms an angle ( $\beta$ ) with respect to the longitudinal axis of the auger, the values of angle ( $\alpha$ ) and angle ( $\beta$ ) being selected for the material properties of the workpiece.” Since the Tisserant drill bit is meant only for use with sheet metal, Tisserant addresses adjustment of the drill bit only for the thickness of the sheet metal material being through which a hole is to be drilled, and not for use with other types of materials. There exists no reason, suggestion, or motivation from the prior art for modifying the teaching of the cited references to provide this limitation. Thus, Tisserant cannot be used with Aasgaard to teach or suggest the rivet assembly claimed in Claim 42. Accordingly, Claim 42 is allowable over the prior art of record.

### Group XI

Claim 16 recites that the “the auger includes a tapered polishing portion having at least one polishing edge, and wherein the thread blends into the polishing portion.” This limitation patentably distinguishes Group XI from Groups I through X.

Tisserant, either alone or in combination with Aasgaard, fails to teach or suggest that the “the auger includes a tapered polishing portion having at least one polishing edge, and wherein the thread blends into the polishing portion” as claimed. As argued with respect to Groups I and VIII, Tisserant is directed to a staged drill bit. Thus, Tisserant does not teach or suggest a polishing portion including a polishing edge. Moreover, Tisserant also does not teach that a thread, since his staged drill bit would not function properly for its intended purpose, boring holes of varying diameters, if provided with a thread. Thus, Tisserant fails to teach or suggest the combination of a thread and polishing portion, wherein the thread blends into the polishing portion. There exists no reason, suggestion, or motivation from the prior art for modifying the teaching of the Tisserant to provide the claimed limitation. Thus, Tisserant cannot be used with Aasgaard to teach or suggest the rivet assembly claimed in Claim 16. Accordingly, Claim 16 is allowable over the prior art of record.

### Group XII

Claims 44 and 45 recite “a plurality of cutting edges helically staged along the groove for pulling the auger through the workpiece.” Claim 44 further recites that these cutting edges may be separated by the thread of the auger. This limitation patentably distinguishes Group XII from Groups I through XI.

Tisserant, either alone or in combination with Aasgaard, fails to teach or suggest a “plurality of cutting edges helically staged along the groove for pulling the auger through the workpiece” as claimed. Instead, Tisserant teaches that “surfaces 32 . . . may be disposed at an angle of 3° or so to effect proper cutting clearance. There exists no reason, suggestion, or motivation from the prior art for modifying the teaching of the Tisserant, i.e., disposing stepped surfaces 32 at an angle, to provide the limitation of providing helically stated cutting edges as claimed. Thus, Tisserant cannot be used with Aasgaard to

teach or suggest the rivet assembly claimed in Claims 44 and 45. Accordingly, Claims 44 and 45 are allowable over the prior art of record.

### **ISSUE III**

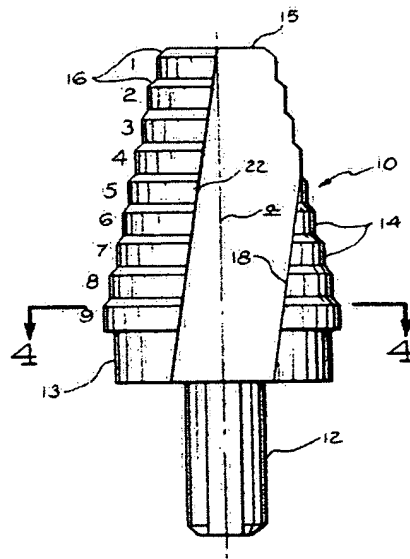
Did the Patent Office properly reject Claims 3, 5, 8, 9, 11, 22, 24, 27, 29 and 37 under 35 U.S.C. § 103(a) as being unpatentable over Aasgaard as modified by Tisserant as applied to claims 1, 2, 20, 26 and 36, and further in view of Korb et al. (U.S. Patent No. 4,582,458)?

### **Groups II, IV and V**

As argued with respect to Issue II, Tisserant, either alone or in combination with Aasgaard, fails to teach or suggest a rivet assembly comprising “a mandrel including an auger having a groove generally longitudinally disposed therein, a cutting portion including at least one cutting edge formed by the groove for incrementally shaving material from the workpiece for forming an aperture in the workpiece as said mandrel is rotated, and a polishing portion including at least one polishing edge formed by the groove for deburring and polishing the aperture created by said at least one cutting edge” as presently claimed in Claim 1 (and claimed in means plus function form in claim 36), or “a mandrel including an auger having a groove generally longitudinally disposed therein for forming at least one cutting edge and at least one polishing edge; wherein . . . the at least one polishing edge is suitable for deburring polishing the aperture created by said at least one cutting edge as claimed in claim 20.

The Korb et al. reference fails to make up for this defect in the Tisserant reference since nowhere does Korb disclose, teach or suggest, a polishing edge as claimed by Applicant. In fact, the Korb et al. reference fails to even address deburring and polishing of apertures formed as their respective bits or fasteners are inserted into a workpiece. Instead, the Korb et al. reference, like the Tisserant reference, discloses a staged drill bit whose cutting edges are stepped (not helically angled) for drilling holes having different diameters in sheet metal. Like the Tisserant bit, the Korb et al. bit is inserted only to the depth or stage needed to form a hole or aperture having the desired diameter and does not

completely penetrate the workpiece like auger of the present invention. Moreover, as argued with respect to Issue II, there exists no reason, suggestion, or motivation from the prior art for modifying the teaching of the cited references to achieve Applicant's invention. Thus, neither Korb et al. or Tisserant can be used with Aasgaard to teach or suggest the rivet assembly claimed in Claims 5, 8, 11, 24, 26 and 29. Accordingly, Claims 5, 8, 11, 24, 26 and 29 are allowable over the prior art of record.



**Figure 3: Korb et al., U.S. Patent No. 4,582,458 (FIG. 1)**

### Group XIII

Claims 3 and 22 recite that “the leading cutting edge extends outwardly from a longitudinal axis of the auger further than the trailing cutting edge.” This limitation patentably distinguishes Group XIII from Groups I through XII.

As argued with respect to Groups II, IV and V, neither Tisserant nor Korb et al., either alone or in combination with Aasgaard, teach or suggest the polishing edge as claimed. Thus, neither Korb et al. nor Tisserant can be used with Aasgaard to teach or

suggest the rivet assembly claimed in Claims 3 and 22. Accordingly, Claims 3 and 22 are allowable over the prior art of record.

#### Group XIV

Claims 9 and 27 recite that “the at least one polishing edge is parallel to a longitudinal axis of the auger.” This limitation patentably distinguishes Group XIV from Groups I through XIII.

As argued with respect to Groups II, IV and V, neither Tisserant nor Korb et al., either alone or in combination with Aasgaard, disclose, teach or suggest a polishing edge as claimed. Thus, neither Korb et al. nor Tisserant can be used with Aasgaard to teach or suggest a polishing edge that is parallel to a longitudinal axis of the auger as claimed in Claims 9 and 27. Accordingly, Claims 9 and 27 are allowable over the prior art of record.

#### ISSUE IV

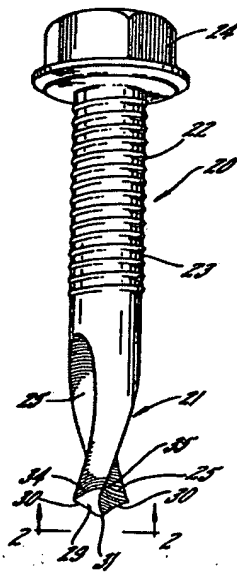
Did the Patent Office properly reject Claims 6, 12, 25 and 30 under 35 U.S.C. § 103(a) as being unpatentable over Aasgaard as modified by Tisserant and Korb as applied to claims 1, 7, 20 and 29, and further, and further in view of Peterson (U.S. Patent No. 5,915,901)?

#### Groups III and IV

As argued with respect to Issue II and III, neither Tisserant or Korb et al., either alone or in combination with Aasgaard, fails to teach or suggest a rivet assembly comprising “a mandrel including an auger having a groove generally longitudinally disposed therein, a cutting portion including at least one cutting edge formed by the groove for incrementally shaving material from the workpiece for forming an aperture in the workpiece as said mandrel is rotated, and a polishing portion including at least one polishing edge formed by the groove for deburring and polishing the aperture created by said at least one cutting edge” as presently claimed in Claim 1 (and claimed in means plus function form in claim 36), or “a mandrel including an auger having a groove generally longitudinally disposed therein for forming at least one cutting edge and at least one

polishing edge; wherein . . . the at least one polishing edge is suitable for deburring polishing the aperture created by said at least one cutting edge as claimed in claim 20.

The Peterson reference fails to make up for this defect in the Tisserant and Korb et al. references since nowhere does Peterson disclose, teach or suggest, a polishing edge as claimed by Applicant. In fact, like Korb et al., the Peterson reference fails to even address deburring and polishing of apertures formed as their respective bits or fasteners are inserted into a workpiece. Instead, Peterson discloses a self-drilling fastener having a drill tip defined by two concave grooves formed one on each side of the shank of the fastener. (Peterson, abstract). The Examiner asserts that the groove 25 forms a polishing edge having a curve. However, nowhere does the Peterson reference disclose, teach or suggest that the groove 25, while curved, forms a polishing edge for deburring and polishing the aperture formed. Moreover, as argued with respect to Issues II and III, there exists no reason, suggestion, or motivation from the prior art for modifying the teaching of the cited references to achieve Applicant's invention. Thus, none of Peterson, Korb et al. or Tisserant can be used with Aasgaard to teach or suggest the rivet assembly claimed in Claims 6, 12, 25 and 30. Accordingly, Claims 6, 12, 25 and 30 are allowable over the prior art of record.



**Figure 4: Peterson, U.S. Patent No. 3,933,075 (FIG. 1)**

### **CONCLUSION**

For the above reasons, it is respectfully submitted that the Patent Office has failed to meet the burden in establishing a *prima facie* basis for the rejections of Claims 1-6, 8-36 and 38-45 discussed herein under 35 U.S.C. §§ 102, 103. Accordingly, reversal of all outstanding rejections is earnestly solicited.

Respectfully submitted,  
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## APPENDIX

### (9) CLAIMS

1. A rivet assembly, comprising:  
a rivet body having a hollow tubular sleeve and an enlarged flattened head suitable for abutting the surface of a work piece; and  
a mandrel disposed in said rivet body, the mandrel including an auger having a groove generally longitudinally disposed therein, a cutting portion including at least one cutting edge formed by the groove for incrementally shaving material from the work piece for forming an aperture in the work piece as said mandrel is rotated, and a polishing portion including at least one polishing edge formed by the groove for deburring and polishing the aperture created by said at least one cutting edge, wherein the aperture formed by the cutting portion and polishing portion receives the hollow tubular sleeve when the rivet body is inserted in the work piece.
2. The rivet assembly as claimed in claim 1, wherein the at least one cutting edge comprises a leading cutting edge and a trailing cutting edge formed on opposite sides of the groove.
3. The rivet assembly as claimed in claim 2, wherein the leading cutting edge extends outwardly from a longitudinal axis of the auger further than the trailing cutting edge.
4. The rivet assembly as claimed in claim 1, wherein the at least one cutting edge is parallel to a longitudinal axis of the auger.
5. The rivet assembly as claimed in claim 1, wherein the at least one cutting edge forms an angle with respect a longitudinal axis of the auger.



6. The rivet assembly as claimed in claim 1, wherein the at least one cutting edge is curved.

7. (Canceled)

8. The rivet assembly as claimed in claim 1, wherein the at least one polishing edge comprises a leading polishing edge and a trailing polishing edge formed on opposite sides of the groove.

9. The rivet assembly as claimed in claim 8, wherein the leading polishing edge extends outwardly from a longitudinal axis of the auger further than the trailing polishing edge.

10. The rivet assembly as claimed in claim 1, wherein the at least one polishing edge is parallel to a longitudinal axis of the auger.

11. The rivet assembly as claimed in claim 1, wherein the at least one polishing edge forms an angle with respect a longitudinal axis of the auger.

12. The rivet assembly as claimed in claim 1, wherein the at least one polishing edge is curved.

13. The rivet assembly as claimed in claim 1, wherein the auger comprises a tip suitable for self-tapping the aperture.

14. The rivet assembly as claimed in claim 13, wherein the tip includes a point suitable for piercing the work piece, the point extending into an initial contact edge for removing work piece material.

15. The rivet assembly as claimed in claim 1, wherein the auger further comprises a thread for pulling the auger through the work piece.

16. The rivet assembly as claimed in claim 15, wherein the auger includes a tapered polishing portion having at least one polishing edge, and wherein the thread blends into the polishing portion.

17. The rivet assembly as claimed in claim 1, further comprising a threaded bolt head extending from the enlarged flattened head opposite the hollow tubular sleeve.

18. The rivet assembly as claimed in claim 1, wherein the mandrel further comprises a shoulder section adjacent to the auger, the shoulder section having an outer diameter greater than the inner diameter of the hollow tubular sleeve, the shoulder section being suitable for radially compressing and spreading the hollow tubular sleeve as said mandrel is retracted, and a shank having an area of reduced diameter spaced rearward from the shoulder section and sized for allowing the auger and shoulder section to be detached upon application of predetermined tensile force to the shank.

19. The rivet assembly as claimed in claim 18, further comprising a threaded bolt head extending from the enlarged flattened head opposite the hollow tubular sleeve, wherein the area of reduced diameter is positioned substantially flush with an end of the bolt head after the auger and shoulder section are detached so that a length of the shank remains in the rivet body.

20. A rivet assembly, comprising:  
a rivet body having a hollow tubular sleeve and an enlarged flattened head suitable for abutting the surface of a work piece; and  
a mandrel disposed in said rivet body, the mandrel including an auger having a groove generally longitudinally disposed therein for forming at least one cutting edge and at least one polishing edge;

wherein the at least one cutting edge is suitable for incrementally shaving material from the work piece as said mandrel is rotated for creating an aperture capable of receiving the hollow tubular sleeve, and the at least one polishing edge is suitable for deburring polishing the aperture created by said at least one cutting edge.

21. The rivet assembly as claimed in claim 20, wherein the at least one cutting edge comprises a leading cutting edge and a trailing cutting edge formed on opposite sides of the groove.

22. The rivet assembly as claimed in claim 20, wherein the leading cutting edge extends outwardly from a longitudinal axis of the auger further than the trailing cutting edge.

23. The rivet assembly as claimed in claim 20, wherein the at least one cutting edge is parallel to a longitudinal axis of the auger.

24. The rivet assembly as claimed in claim 20, wherein the at least one cutting edge forms an angle with respect to a longitudinal axis of the auger.

25. The rivet assembly as claimed in claim 20, wherein the at least one cutting edge is curved.

26. The rivet assembly as claimed in claim 20, wherein the at least one polishing edge comprises a leading polishing edge and a trailing polishing edge formed on opposite sides of the groove.

27. The rivet assembly as claimed in claim 26, wherein the leading polishing edge extends outwardly from a longitudinal axis of the auger further than the trailing polishing edge.

28. The rivet assembly as claimed in claim 20, wherein the at least one polishing edge is parallel to a longitudinal axis of the auger.

29. The rivet assembly as claimed in claim 20, wherein the at least one polishing edge forms an angle with respect a longitudinal axis of the auger.

30. The rivet assembly as claimed in claim 29, wherein the at least one polishing edge is curved.

31. The rivet assembly as claimed in claim 20, wherein the auger comprises a tip suitable for self-tapping the aperture.

32. The rivet assembly as claimed in claim 31, wherein the tip includes a point suitable for piercing the work piece, the point extending into an initial contact edge for removing work piece material.

33. The rivet assembly as claimed in claim 20, wherein the auger further comprises a thread for pulling the auger through the work piece.

34. The rivet assembly as claimed in claim 20, further comprising a threaded bolt head extending from the enlarged flattened head opposite the hollow tubular sleeve.

35. The rivet assembly as claimed in claim 20, wherein the mandrel further comprises a shoulder section adjacent to the auger, the shoulder section having an outer diameter greater than the inner diameter of the hollow tubular sleeve, the shoulder section being suitable for radially compressing and spreading the hollow tubular sleeve as said mandrel is retracted, and a shank having an area of reduced diameter spaced rearward from the shoulder section and sized for allowing the auger and shoulder section to be detached upon application of predetermined tensile force to the shank.

36. A rivet assembly, comprising:  
a rivet body having a hollow tubular sleeve and an enlarged flattened head suitable for abutting the surface of a work piece; and  
a mandrel disposed in said rivet body, the mandrel including an auger having a groove generally longitudinally disposed therein, means for cutting material from the work piece as the mandrel is rotated for forming an aperture, and means for deburring and polishing the aperture created by said cutting means,  
wherein the aperture formed by the cutting means and polishing means receives the hollow tubular sleeve when the rivet body is inserted in the work.

37. (Canceled)

38. The rivet assembly as claimed in claim 36, wherein the auger further comprises means for self-tapping the aperture.

39. The rivet assembly as claimed in claim 36, wherein the auger further comprises means for pulling the auger through the work piece.

40. The rivet assembly as claimed in claim 36, further comprising a threaded bolt head extending from the enlarged flattened head opposite the hollow tubular sleeve.

41. The rivet assembly as claimed in claim 1, wherein the auger comprises a tip and shoulder portion, the groove being formed so that it extends longitudinally through the auger from the tip through the shoulder portion.

42. The rivet assembly as claimed in claim 1, wherein the auger has a length (l), the at least one cutting edge forms an angle ( $\alpha$ ) with respect to the longitudinal axis of the auger and the at least one polishing edge forms an angle ( $\beta$ ) with respect to the longitudinal axis of the auger, the values of angle ( $\alpha$ ) and angle ( $\beta$ ) being selected for the material

properties of the work piece.

43. The rivet assembly as claimed in claim 14, wherein the point and initial contact edge tap an aperture in the work piece by puncturing and separating the work piece and then scraping material from the work piece for pulling the auger through the work piece so that the auger is self-tapping.

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44. The rivet assembly as claimed in claim 15, wherein the thread separates the at least one cutting edge into a plurality of cutting edges helically staged along the groove for pulling the auger through the work piece.

45. The rivet assembly as claimed in claim 1, wherein at least one cutting edge comprises a plurality of cutting edges helically staged along the groove for pulling the auger through the work piece.